FIVE YEAR REVIEW

OPERABLE UNIT 2

DEFENSE DISTRIBUTION DEPOT OGDEN

OGDEN, UTAH

FIVE YEAR REVIEW

Defense Distribution Depot Ogden
Operable Unit 2

Defense Distribution Depot Ogden has conducted a Five-Year Review and prepared this report under requirements of Section 121(c) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended, and Section 300.430(f)(4)(ii) of the National Contingency Plan (NCP). This Five-Year Review was conducted in accordance with procedures in OSWER Directive 9355.7-02, Structure and Components of Five-Year Reviews dated May 23, 1991 and OSWER Directive 9355.7-02A, Supplemental Five-Year Review Guidance June 26, 1994.

Five-Year Reviews are intended to evaluate whether the remedy selected in the Record of Decision and implemented during remedial action remains protective of public health and the environment. Statutory Five-Year Reviews are required no less often than each five years after the initiation of the remedial action.

SITE LOCATION AND HISTORY

DDOU is located in the northern reaches of the City of Ogden, Weber County, Utah. The Depot is situated in a semi-rural setting with the small communities of Harrisville to the north, Farr West to the west, and numerous small ranches and a few small businesses located to the west, east, and south. DDOU covers approximately 1,100 acres in a topographically flat area within the Great Salt Lake Valley. It is drained by Mill and Four-Mile Creeks, both of which traverse the installation from east to west.

In the past, both liquid and solid materials have been disposed of at DDOU. Oily liquid materials and combustible solvents were burned in burning pits, and solid materials were buried, burned, or taken off-site for disposal. Several waste disposal areas have been identified on property currently or formerly controlled by DDOU. In July 1987, DDOU was placed on the National Priorities List as a Federal facility requiring CERCLA investigation. On 30 November 1989, a Federal Facility Agreement (FFA) was signed by DDOU, EPA Region VIII, and the State of Utah. The FFA divided the burial sites at DDOU into four operable units. Under the National Contingency Plan (NCP), “an operable unit is a discrete part of a remedial action that can function independently as a unit and contributes to preventing or minimizing a release or threat of a release”.

Operable Unit 2 (OU2) is located on DDOU just north of the Facilities Engineering Complex, Building 23. OU2 is composed of the French Drain Area, the former Pesticide Storage Building, and the Parade Ground Area. The French Drain Area consists of an 8.5 foot by 20 foot area which was excavated to a depth of 2.5 to 4 feet, filled with gravel, and used as a mixing and loading area for pesticides and herbicides. The former Pesticide Storage Building (Building 51) was used in the past for storing and mixing pesticides. The Parade Ground is a grassy area south of the French Drain, where two oil burning pits

were identified in DDOU records. The exact locations of these pits were not known. However, soil gas and groundwater survey revealed evidence of possible waste disposal sites in this area. In a recent environmental baseline survey, new information was uncovered and these pits will be investigated as part of the Base Realignment and Closure (BRAC) Cleanup Plan.

The Record of Decision (ROD) for OU2 was signed in September 1990 by DDOU, the State of Utah and EPA Region VIII. After the 1990 ROD, additional information was obtained which warranted modifications to the ROD. A Health Based Risk Assessment and Explanation of Significant Difference was prepared by DDOU in August 1994 to change cleanup levels for bromacil. An Explanation of Significant Differences to the Record of Decision (ESD) was issued in September 1994, incorporating these modifications.

Remedial Design for OU2 began in July 1991 and remedial action was started in November 1991. The soil remedial action was completed in 1994. Groundwater cleanup began in 1992 and is still ongoing.

CONTAMINANTS OF CONCERN

Soil contamination included the pesticide chlordane and the herbicide bromacil. The volatile organic compound (VOC) trichloroethane (TCE) is the primary contaminant of concern in the groundwater. Other VOC's detected in samples from the wells at OU2 include tetrachloroethylene (PCE) and cis-1,2-dichloroethylene (cis-1,2-DCE).

REMEDIAL OBJECTIVES

The purpose of excavation and off-site incineration of soil was to protect people by removing the potential for contact with pesticides/herbicides and eliminating any possibility of the pesticide contaminated soils contributing to future groundwater contamination.

The purpose of the groundwater treatment facility is to eliminate the off-site migration of contamination groundwater in the shallow aquifer system, and to treat the contaminants in the groundwater below their MCLs. This will also result in compliance with all applicable or relevant and appropriate requirements (ARARs).

SELECTED REMEDY

The selected remedy for OU2 listed in the ROD was on-site groundwater treatment and off-site incineration of contaminated soil.

EFFECTIVENESS EVALUATION OF SOIL REMEDIATION

The remediation standards for soil remediation activities were the concentrations of contaminants in soils at their designed cleanup levels. Verification testing was required to ensure that all soils having contaminant concentrations above cleanup levels were removed. The primary contaminant of concern in the French Drain area soils were chlordane and bromacil. The cleanup level agreed upon in the Record of Decision (ROD) for OU2 for each contaminant was 1 mg/kg. Soil remediation activities were comprised of four rounds of excavation and confirmatory sampling. The cleanup standard for chlordane was met. Due to the widespread presence of bromacil in the French Drain Area and results of a risk assessment on the remaining concentrations of bromacil in the soils, an ESD was developed to modify the Bromacil cleanup level as listed in the ROD from 1 mg/kg to 16 mg/kg. The final confirmatory sampling results for Chlordane and Bromacil were below their levels (Chlordane = 1 mg/kg, Bromacil = 16 mg/kg). All contaminated soil excavated from the French Drain area was transported to incineration facilities in accordance with all local, state and federal regulations. The contaminated soil was excavated and transported off-site for incineration at the following facilities: ENSCO's facility in El Dorado, Arkansas; Chemical Waste Management's facility in Port Arthur, Texas; and LWD, Inc. facilitity in Calvert City, Kentucky. The excavation was centered at the French Drain and was 33 feet long, 23 feet wide, and 10 feet deep. There were 268.5 tons of soil removed from OU2. Soil removal was completed in October 1994. The area excavated was then surveyed, backfilled and repaved with asphalt. The off-site material which was used to backfill the French Drain area excavation was tested prior to placement to ensure that the material was free of contaminants. This concluded the soil remedial action activities within the French Drain Area.

EFFECTIVENESS EVALUATION OF GROUNDWATER TREATMENT

The groundwater is extracted from groundwater wells and then the water is pumped through an air stripper. The treated water is injected (pumped) back into the same aquifer. This groundwater extraction and treatment is employed to control potential future exposures and risks associated with consumption of contaminated groundwater. The groundwater extraction and treatment began in September 1992.

During the first year of operation, the air tower experienced problems with scaling throughout the system. Calcium carbonate scale had began forming on the inside of well casings and pumps which created a serious decrease in water flow throughout the system. DDOU installed a chemical injection system in the air tower to treat the water to prevent further scaling. Sodium Hexametaphosphate (SHMP) was added to the water via the injection system. This curbed the buildup of new scale within the system but the SHMP was not able to completely break down the existing scale.

Because much of the system had already suffered decreased flow due to the carbonate scaling, DDOU found it necessary to redevelop some injection wells. The wells which had suffered the greatest loss in flow volume were treated with mild acid to remove the scaling. The acid and loosened scale were recovered from the wells and disposed of in accordance with all local, state and federal regulations. DDOU learned that this method of redevelopment is highly successful because in most cases the well recovered to full capacity. As a result of this scaling problem at OU2, the SHMP injection system has been incorporated at OU1 and OU4 Air Tower.

Evaluation of the groundwater quality data indicates that as of January 1996 the quality of the water has improved considerably from the baseline water quality. See attached tables showing concentrations of contaminants over time in each of the monitoring wells. TCE is the primary contaminant of concern in the groundwater at OU2. Historically, during the second year, third and fourth quarterly sampling events, all wells within Operable Unit 2 had contaminant concentrations at or below their respective MCLs. The increases in contaminant concentrations during the first and second quarterly sampling events of the third year of operation and during the first quarterly sampling event of the fourth year of operation coincide with low water levels in the area which typically occur at this time of year. During the first quarter sampling event in January 1996, only Well E-2 had a concentration of TCE at its MCL of 5 parts per billion (ppb). This increase in the concentration of TCE has occurred after two consecutive quarterly sampling events with concentrations of contaminants below MCLs in all wells. The other two contaminants of concern are PCE and cis-1,2-DCE. PCE was found in Well ESE-5 to have increased to 10 ppb after six consecutive quarterly sampling events with concentrations of PCE below its MCL of 5 ppb. Well ESE-5 is the only monitoring point within OU2 with the concentration of PCE above its MCL. Monitoring Well ESE-5 is located outside the TCE plume and outside the area subjected to remediation. Because this well was outside the area being treated by the air stripping tower, DDOU proposed to EPA Region VIII and the Sate of Utah that this well be deleted from the OU2 required compliance sampling wells. DDOU further proposed the well and area surrounding the well should be investigated/remediated during the Environmental Baseline Survey Investigation. DDOU will continue to sample this well concurrent with the OU2 sampling event in order to track contamination. This was concurred with by the State of Utah and EPA Region VIII.

CONTINUING OPERATIONS AND MAINTENANCE

The following outlines the continuing work that will be ongoing at OU2:

Environmental/performance monitoring will continue to be conducted in accordance with applicable monitoring plans.

Operation and maintenance of the groundwater treatment facility will continue.

AREAS OF NONCOMPLIANCE

No areas of noncompliance have been identified. However, since Operable Unit 2 has no stated boundaries, the Contaminant Screening Sites (CSS) will be discussed in this Five-Year Review. The Federal Facility Agreement listed 9 CSSs to be investigated under the Remedial Investigation/Feasibility Study at DDOU. It was determined that these sites would be investigated after the remediation had taken place at the 4 operable units. The following is a brief description of the original nine CSSs:

(1) **DDT Storage**. Building 5X was used to store DDT when DDOU became the collection point for DDT storage for western states after EPA banned its use. The storage areas were regularly checked for damaged or leaking containers and all damaged containers were recontainerized in 55-gallon drums.

(2) **DDT and Hazardous Chemical Storage**. Building 4X was used to store, DDT, acids, bases and solvents. DDT was managed in this building under the same procedures as in Building 5X.

(3) **Hazardous Chemical Storage**. Building 275 is used for chemical storage under procedures similar to Buildings 4X and 5X.

(4) **Vaulted Leaking Transformers**. This site included several different locations where a total of forty vault-enclosed transformers showed signs of light seeping or leaking. The transformers, containing Pyranol oil composed of polychlorinated biphenyls (PCBs) were replaced, and seepage on the vaults was cleaned up. The PCB transformers and residue was then disposed of in 1982 and 1983. The vaults presently contain serviceable transformers which show no signs of seepage or leakage.

(5) **Transformer Storage**. Leaking transformers removed from the vaults were held in Building 11B-2 prior to disposal by the Defense Property Disposal Office. The transformers were stored in metal pans in order to catch any leaking oils.

(6) **Nonvaulted Leaking Transformers**. Eleven leaking transformers, mounted on racks in four areas, were found to be filled with Pyronal PCB oil. These leaking PCB transformers had contaminated the mounting racks and surface soil beneath them. The transformers, mounting racks and contaminated soil were removed and disposed of in 1982 and 1983 and new transformers and mounting racks were installed.

(7) **Pistol Range and Old Skeet Range**. The pistol and skeet ranges have never had extensive use and the spent cartridges from both ranges and the lead from the pistol range have always been cleaned up and turned in to the Defense Property Disposal Office.

(8) **World War II Mustard Storage Area**. Over one million pounds of mustard gas was stored in one-ton containers in the igloo area near Building 118 from 1942 to 1946.

Chemical agent identification (I.D.) sets were also stored in this area. No problems were reported with storage of the one-ton containers. However, several substandard containers of the chemical agent I.D. sets were received and immediately disposed of in Operable Unit 3.

(9) **Western Boundary Area**. The western boundary occupies a strip measuring approximately 7,000 feet along the western property boundary of the DDOU facility. Tomlinson Road extends in a north-south direction and lies just outside the entire western margin of the western boundary area. There are no known disposal sites along the western boundary, excluding Site 1 at the far south end and the Oil Burning Pits Site at the north end. Since groundwater flow is generally to the west, the western boundary area will be investigated further to determine the potential for offsite migration of contamination.

The CSS Investigation is currently under way. Those sites perceived to have the greatest risk will be handled first; i.e., PCB and DDT areas, Western Boundary and then the Lead investigation at the pistol range. Progress is as follows:

Upon further investigation of CSS #8 (Mustard Storage Area), it was determined that no further action was necessary. This was agreed upon by the State of Utah and EPA Region VIII in July 1991. DDOU will begin investigation/remediation of CSSs # 1 thru 6 (PCB and DDT areas) in the summer of 1996. The DDOU PCB Transformer Storage Yard, located southwest of Building 51, will also be investigated/remediated at the same time. This site was identified by the Army Environmental Hygiene Agency in 1992 because of the concerns expressed in the health assessment conducted in 1991 regarding the potential exposure of children from the nearby family housing area to PCBs. Warehouse 4A was added to the CSSs for DDT areas during the Phase II Remedial Investigation. CSS # 9 (western boundary area) will be in design stage by summer of 1996. Investigation/ remediation of CSS # 7 (pistol range) will begin in the fall of 1996. DDOU is striving to meet the goal of complete close-out of the CSSs by September 1997.

RECOMMENDATIONS

Recommendations are as follows:

ROD for OU2 was changed by an ESD to modify the Bromacil cleanup level from 1 ppm to 16 ppm.

ROD will be modified to show that cleanup levels in the groundwater will be changed from “below MCL” to “at or below MCL”.

Because Monitoring Well ESE-5 is located outside the area subjected to remediation and it is showing signs of contamination with PCE, this area will be investigated/remediated during the Environmental Baseline Survey Investigation. It will no longer be included in the required compliance sampling wells for OU2.

The Federal Facility Agreement listed 9 CSSs to be investigated under the RI/FS at DDOU. It was determined that these sites would be investigated after the remediation had taken place at the four operable units. Since the operable units have been remediated, the CSS Investigation is currently under way.

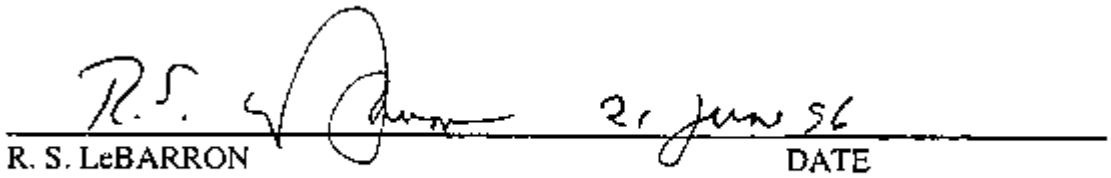
There were two burning pits identified in DDOU records in the Parade Ground area. The exact locations of these pits were not known. However, in a recent environmental baseline survey, new information was uncovered and these pits will be investigated as part of the BRAC cleanup plan.

NEXT FIVE YEAR REVIEW

The next five-year review will be conducted on or before July 31, 2001.

STATEMENT ON PROTECTIVENESS

I certify that the remedies selected for this site are or will be fully implemented and will remain protective of human health and the environment.



21 June 96

R. S. LeBARRON
Colonel, USA
Commander

DATE

TABLE 2

SUMMARY OF ANALYTICAL RESULTS OF WELLS SAMPLED AFTER 39 MONTHS OF REMEDIAL SYSTEM OPERATION
QUARTERLY GROUND WATER MONITORING REPORT, OPERABLE UNIT NO. 2
DEFENSE DEPOT OGDEN, UTAH

		Ground Water Constituent				
		TCE	**cis-1,2-DCE**	**PCE**	**Chlordane**	**DDD**
	MCL (ppb)	5	70	5	2	NA
	Treatment System Effluent Requirements (ppb)	2.5	35	NA	NA	NA
Sample Location	**Sampling Date**	**Constituent Concentrations**				
ESE-5	11/20/91	< 0.3	< 0.2	5	NT	NT
	04/20/93	< 0.5	< 0.5	2	< 0.5	< 0.1
	07/26/93	< 0.5	< 0.5	0.9	< 0.5	< 0.1
	10/05/93	< 0.5	< 0.5	2	< 0.5	< 0.1
	01/17/94	< 0.5	< 0.5	11	< 0.5	< 0.1
	03/31/94	< 0.5	< 0.5	11	< 0.5	< 0.1
	07/20/94	< 0.5	< 0.5	< 0.5	< 0.5	< 0.1
	10/06/94	< 0.5	< 0.5	2	< 0.5	< 0.1
	01/13/95	< 0.5	< 0.5	3	< 1	< 0.1
	04/11/95	< 0.5	< 0.5	< 0.5	NT	NT
	07/19/95	< 0.5	< 0.5	0.8	NT	NT
	10/11/95	< 0.5	< 0.5	1	NT	NT
	01/18/96	< 0.5	1	10	NT	NT
	Sample Mean	BDL	0.5	3.8	BDL	BDL
JMM-10	12/03/91	11	36	< 0.1	NT	NT
	02/05/93	1	1	< 0.5	< 0.5	< 0.1
	04/19/93	2	2	< 0.5	< 0.5	< 0.1
	07/14/93	4	14	< 0.5	< 0.5	< 0.1
	10/12/93	3	13	< 0.5	< 0.5	< 0.1
	01/14/94	1	2	< 0.5	< 0.5	< 0.1
	03/25/94	0.7	0.9	< 0.5	< 0.5	< 0.1
	07/13/94	1	3	< 0.5	< 0.5	< 0.1
	10/20/94	2	4	< 0.5	< 0.5	< 0.1
	01/11/95	1	1	< 0.5	< 0.5	< 0.1
	07/21/95	< 0.5	< 0.5	< 0.5	NT	NT
	04/07/95	1	1	< 0.5	NT	NT
	10/20/95	2	9	< 0.5	NT	NT
	01/11/96	0.9	1	< 0.5	NT	NT
	Sample Mean	2.2	6.3	BDL	BDL	BDL
JMM-11	11/22/91	7	16	< 0.1	NT	NT
	02/28/93	6	9	< 0.5	< 0.5	< 0.1
	04/26/93	7	11	< 0.5	< 0.52	< 0.1
	07/25/93	5	8	< 0.5	< 0.5	< 0.1
	10/13/93	5	7	< 0.5	< 0.5	< 0.1
	01/18/94	3	5	< 0.5	< 0.5	< 0.1
	03/30/94	4	9	< 0.5	< 0.5	< 0.1
	07/19/94	1	3	< 0.5	< 0.5	< 0.1
	10/25/94	3	4	< 0.5	< 0.5	< 0.1
	01/13/95	4	9	< 0.5	< 0.5	< 0.1
	07/19/95	3	4	< 0.5	NT	NT
	04/11/95	4	9	< 0.5	NT	NT
	10/26/95	2	3	< 0.5	NT	NT
	01/18/96	3	5	< 0.5	NT	NT
	Sample Mean	4.1	7.3	BDL	BDL	BDL

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DEFENSE DEPOT OGDEN, UTAH

		Ground Water Constituent				
		TCE	cis-1,2-DCE	PCE	Chlordane	DDD
	MCL (ppb)	5	70	5	2	NA
	Treatment System Effluent Requirements (ppb)	2.5	35	NA	NA	NA
Sample Location	Sampling Date	Constituent Concentrations				
JMM-13	11/22/91	7	7	< 0.1	NT	NT
	02/09/93	2	3	< 0.5	< 0.5	< 0.1
	04/16/93	0.5	< 0.5	< 0.5	< 0.5	< 0.1
	07/13/93	< 0.5	< 0.5	< 0.5	< 0.5	< 0.1
	10/11 /93	0.7	0.6	< 0.5	< 0.5	< 0.1
	01/10/94	11	92	< 0.5	< 0.5	< 0.1
	03/25/94	10	36	< 0.5	< 0.5	< 0.1
	07/12/94	< 0.5	< 0.5	< 0.5	< 0.5	< 0.1
	10/19/94	1	0.8	< 0.5	< 0.5	< 0.1
	01/10/95	4	7	< 0.5	< 0.5	< 0.1
	04/06/95	0.6	< 0.5	< 0.5	NT	NT
	07/20/95	< 0.5	< 0.5	< 0.5	NT	NT
	10/19/95	0.6	0.5	< 0.5	NT	NT
	01/10/96	4	21	< 0.5	NT	NT
	Sample Mean	3.1	12.2	BDL	BDL	BDL
JMM-24	11/20/91	< 0.3	< 0.2	< 0.1	NT	NT
	02/03/93	< 0.5	< 0.5	< 0.5	< 0.5	< 0.1
	04/19/93	< 0.5	< 0.5	< 0.5	< 0.5	< 0.1
	07/13/93	0.5	< 0.5	< 0.5	< 0.5	< 0.1
	09/30/93	< 0.5	< 0.5	< 0.5	< 0.5	< 0.1
	01/10/94	< 0.5	< 0.5	< 0.5	< 0.5	< 0.1
	03/24/94	< 0.5	< 0.5	< 0.5	< 0.5	< 0.1
	07/12/94	< 0.5	< 0.5	< 0.5	< 0.5	< 0.1
	10/04/94	< 0.5	< 0.5	< 0.5	< 0.5	< 0.1
	01/09/95	< 0.5	< 0.5	< 0.5	< 0.5	< 0.1
	04/06/95	< 0.5	< 0.5	< 0.5	NT	NT
	07/20/95	< 0.5	< 0.5	< 0.5	NT	NT
	10/10/95	< 0.5	< 0.5	< 0.5	NT	NT
	01/09/96	< 0.5	< 0.5	< 0.5	NT	NT
	Sample Mean	BDL	BDL	BDL	BDL	BDL
JMM-26	11/24/91	3	3	< 0.1	NT	NT
	01/13/93	2	2	0.6	< 0.5	< 0.1
	04/15/93	2	1	< 0.5	< 0.5	< 0.1
	07/07/93	1	0.9	< 0.5	< 0.5	< 0.1
	09/26/93	1	2	< 0.5	< 0.5	< 0.1
	01/05/94	< 0.5	1	< 0.5	< 0.5	< 0.1
	03/22/94	1	0.9	< 0.5	< 0.5	< 0.1
	07/08/94	1	1	< 0.5	< 0.5	< 0.1
	10/03/94	2	1	< 0.5	< 1.1	< 0.22
	01/06/95	1	0.9	< 0.5	< 0.5	< 0.1
	04/05/95	1	0.6	< 0.5	NT	NT
	07/17/95	1	0.9	< 0.5	NT	NT
	10/09/95	1	1	< 0.5	NT	NT
	01/08/96	1	0.8	< 0.5	NT	NT
	Sample Mean	1.3	1.2	< 0.5	BDL	BDL

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		Ground Water Constituent				
		TCE	cis-1,2-DCE	PCE	Chlordane	DDD
	MCL (ppb)	5	70	5	2	NA
	Treatment System Effluent Requirements (ppb)	2.5	35	NA	NA	NA
Sample Location	Sampling Date	Constituent Concentrations				
JMM-27	11/23/91	< 0.3	< 0.2	1	NT	NT
	02/02/93	< 0.5	< 0.5	1	< 0.5	< 0.1
	04/14/93	< 0.5	< 0.5	0.8	< 1.0	< 0.2
	07/12/93	< 0.5	< 0.5	0.7	< 0.5	< 0.1
	09/30/93	< 0.5	< 0.5	0.6	< 0.5	< 0.1
	01/06/94	< 0.5	< 0.5	0.8	< 0.5	< 0.1
	03/23/94	< 0.5	< 0.5	0.6	< 0.5	< 0.1
	07/20/94	< 0.5	< 0.5	< 0.5	< 0.5	< 0.1
	09/30/94	< 0.5	< 0.5	0.6	< 0.5	< 0.1
	01/09/95	< 0.5	< 0.5	< 0.5	< 0.5	< 0.1
	04/06/95	< 0.5	< 0.5	0.6	NT	NT
	07/10/95	< 0.5	< 0.5	0.8	NT	NT
	10/05/95	< 0.5	< 0.5	< 0.5	NT	NT
	01/09/96	< 0.5	< 0.5	0.6	NT	NT
	Sample Mean	BDL	BDL	0.7	BDL	BDL
JMM-50	11/21/91	7	21	< 0.1	NT	NT
	01/28/93	0.8	5	< 0.5	< 0.5	< 0.1
	04/26/93	4	6	< 0.5	< 0.52	< 0.1
	07/21/93	2	6	< 0.5	< 0.5	< 0.1
	10/13/93	4	10	< 0.5	< 0.5	< 0.1
	01/17/94	3	10	< 0.5	< 0.5	< 0.1
	03/30/94	3	5	< 0.5	< 0.5	< 0.1
	07/20/94	1	2	< 0.5	< 0.5	< 0.1
	10/21/94	3	11	< 0.5	< 0.5	< 0.1
	01/13/95	3	10	< 0.5	< 0.5	< 0.1
	04/11/95	3	5	< 0.5	NT	NT
	07/21/95	< 0.5	0.5	< 0.5	NT	NT
	10/24/95	3	5	< 0.5	NT	NT
	01/17/96	3	8	< 0.5	NT	NT
	Sample Mean	2.9	7.5	BDL	BDL	BDL
CA-1	12/07/91	7	28	< 0.1	NT	NT
	02/28/93	3	8	< 0.5	< 0.5	< 0.1
	04/22/93	1	5	< 0.5	< 0.5	< 0.1
	07/25/93	2	6	< 0.5	< 0.5	< 0.1
	10/13/93	2	6	< 0.5	< 0.5	< 0.1
	01/17/94	2	7	< 0.5	< 0.5	< 0.1
	03/27/94	2	7	< 0.5	< 0.5	< 0.1
	07/15/94	1	6	< 0.5	< 0.5	< 0.1
	10/21/94	2	7	< 0.5	< 0.5	< 0.1
	01/11/95	2	9	< 0.5	< 0.5	< 0.1
	04/10/95	1	4	< 0.5	NT	NT
	07/21/95	1	4	< 0.5	NT	NT
	10/23/95	1	5	< 0.5	NT	NT
	01/15/96	2	6	< 0.5	NT	NT
	Sample Mean	2.1	7.7	BDL	BDL	BDL

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DEFENSE DEPOT OGDEN, UTAH

		Ground Water Constituent				
		TCE	cis-1,2-DCE	PCE	Chlordane	DDD
	MCL (ppb)	5	70	5	2	NA
	Treatment System Effluent Requirements (ppb)	2.5	35	NA	NA	NA
Sample Location	Sampling Date	Constituent Concentrations				
CA-2	12/07/91	7	11	< 0.1	NT	NT
	02/17/93	4.9	6.9	< 0.5	< 0.5	< 0.1
	04/22/93	4	4	< 0.5	< 0.5	< 0.1
	07/21/93	3	3	< 0.5	< 0.5	< 0.1
	10/12/93	4	3	< 0.5	< 0.5	< 0.1
	01/14/94	3	2	< 0.5	< 0.5	< 0.1
	03/29/94	3	3	< 0.5	< 0.5	< 0.1
	07/18/94	2	2	< 0.5	< 0.5	< 0.1
	10/25/94	2	2	< 0.5	< 0.5	< 0.1
	01/13/95	3	3	< 0.5	< 0.5	< 0.1
	04/11/95	2	2	< 0.5	NT	NT
	07/18/95	2	2	< 0.5	NT	NT
	10/26/95	2	2	< 0.5	NT	NT
	01/17/96	2	2	< 0.5	NT	NT
	Sample Mean	3.1	3.4	BDL	BDL	BDL
CA-3	12/17/91	6	13	0.4	NT	NT
	02/23/93	3	3	< 0.5	< 0.5	< 0.1
	04/23/93	2	3	< 0.5	< 0.52	< 0.1
	07/22/93	2	4	< 0.5	< 0.5	< 0.1
	10/13/93	3	7	< 0.5	< 0.5	< 0.1
	01/18/94	3	5	< 0.5	< 0.5	< 0.1
	03/30/94	2	2	< 0.5	< 0-5	< 0.1
	07/18/94	0.8	1.0	< 0.5	< 0.5	< 0.1
	10/24/94	1	3	< 0.5	< 0.5	< 0.1
	01/12/95	2	4	< 0.5	< 0.5	< 0.1
	04/11/95	2	2	< 0.5	NT	NT
	07/19/95	1	0.8	< 0.5	NT	NT
	10/25/95	< 0.5	2	< 0.5	NT	NT
	01/15/96	1	1	< 0.5	NT	NT
	Sample Mean	2.1	3.6	< 0.5	BDL	BDL
CA-4	12/03/91	< 0.3	3	< 0.1	NT	NT
	01/27/93	< 0.5	< 0.5	< 0.5	< 0.5	< 0.1
	04/15/93	< 0.5	0.6	< 0.5	< 1.0	< 0.2
	07/13/93	0.6	1	< 0.5	< 0.5	< 0.1
	10/01/93	< 0.5	< 0.7	< 0.5	< 0.5	< 0.1
	01/12/94	< 0.5	< 0.5	< 0.4	< 0.5	< 0.1
	03/24/94	< 0.5	< 0.5	< 0.5	< 0.5	< 0.1
	07/11/94	< 0.5	2	< 0.5	< 0.5	< 0.1
	10/04/94	< 0.5	< 0.5	< 0.5	< 0.5	< 0.1
	01/10/95	< 0.5	< 0.5	< 0.5	< 0.5	< 0.1
	04/06/95	< 0.5	< 0.5	< 0.5	NT	NT
	07/20/95	< 0.5	< 0.5	< 0.5	NT	NT
	10/10/95	< 0.5	< 0.5	< 0.5	NT	NT
	01/10/96	< 0.5	< 0.5	< 0.5	NT	NT
	Sample Mean	< 0.5	0.8	BDL	BDL	BDL

TABLE 2

SUMMARY OF ANALYTICAL RESULTS OF WELLS SAMPLED AFTER 39 MONTHS OF REMEDIAL SYSTEM OPERATION
QUARTERLY GROUND WATER MONITORING REPORT, OPERABLE UNIT NO. 2
DEFENSE DEPOT OGDEN, UTAH

		Ground Water Constituent				
		TCE	cis-1,2-DCE	PCE	Chlordane	DDD
	MCL (ppb)	5	70	5	2	NA
	Treatment System Effluent Requirements (ppb)	2.5	35	NA	NA	NA
Sample Location	Sampling Date	Constituent Concentrations				
CA-7	02/17/93	4.9	8.1	< 0.5	< 0.5	< 0.1
	04/21/93	3	3	< 0.5	< 0.5	< 0.1
	07/21/93	2	3	< 0.5	< 0.5	< 0.1
	10/12/93	4	3	< 0.5	< 0.5	< 0.1
	01/13/94	3	5	< 0.5	< 0.5	< 0.1
	03/29/94	3	5	< 0.5	< 0.5	< 0.1
	07/15/94	< 0.5	4	< 0.5	< 0.5	< 0.1
	10/24/94	3	3	< 0.5	< 0.5	< 0.1
	01/12/95	4	8	< 0.5	< 0.5	< 0.1
	04/10/95	2	2	< 0.5	NT	NT
	07/18/95	2	2	< 0.5	NT	NT
	10/25/95	2	< 0.5	< 0.5	NT	NT
	01/16/96	3	4	< 0.5	NT	NT
	Sample Mean	2.8	3.9	BDL	BDL	BDL
CA-8	01/02/92	3	10	< 0.1	NT	NT
	01/29/93	1	4	< 0.5	< 0.5	< 0.1
	04/20/93	1	2	< 0.5	< 0.5	< 0.1
	07/20/93	1	3	< 0.5	< 0.5	< 0.1
	10/04/93	< 0.5	< 0.5	< 0.5	< 0.5	< 0.1
	01/14/94	< 0.5	< 0.5	< 0.5	< 0.5	< 0.1
	03/28/94	< 0.5	< 0.5	< 0.5	< 0.5	< 0.1
	07/14/94	< 0.5	< 0.5	< 0.5	< 0.5	< 0.1
	10/05/94	< 0.5	< 0.5	< 0.5	< 0.52	< 0.1
	01/11/95	< 0.5	< 0.5	< 0.5	< 0.5	< 0.1
	04/10/95	< 0.5	< 0.5	< 0.5	NT	NT
	07/18/95	1	2	< 0.5	NT	NT
	10/11/95	0.8	1	< 0.5	NT	NT
	01/16/96	0.5	0.9	< 0.5	NT	NT
	Sample Mean	0.9	1.9	BDL	BDL	BDL
CA-9	02/11/93	2	24	< 0.5	< 0.5	< 0.1
	04/19/93	3	10	< 0.5	< 0.5	< 0.1
	07/14/93	1	0.9	< 0.5	< 0.5	< 0.1
	10/11/93	3	22	< 0.5	< 0.5	< 0.1
	01/12/94	5	19	< 0.5	< 0.5	< 0.1
	03/25/94	6	19	< 0.5	< 0.5	< 0.1
	07/14/94	0.5	< 0.5	< 0.5	< 0.5	< 0.1
	10/20/94	3	27	< 0.5	< 0.5	< 0.1
	01/11/95	5	28	< 0.5	< 0.5	< 0.1
	04/07/95	5	18	< 0.5	NT	NT
	07/20/95	0.5	< 0.5	< 0.5	NT	NT
	10/23/95	4	21	< 0.5	NT	NT
	01/11/96	4	18	< 0.5	NT	NT
	Sample Mean	3.2	16	BDL	BDL	BDL

TABLE 2

SUMMARY OF ANALYTICAL RESULTS OF WELLS SAMPLED AFTER 39 MONTHS OF REMEDIAL SYSTEM OPERATION
QUARTERLY GROUND WATER MONITORING REPORT, OPERABLE UNIT NO. 2
DEFENSE DEPOT OGDEN, UTAH

		Ground Water Constituent				
		TCE	cis-1,2-DCE	PCE	Chlordane	DDD
	MCL (ppb)	5	70	5	2	NA
	Treatment System Effluent Requirements (ppb)	2.5	35	NA	NA	NA
Sample Location	Sampling Date	Constituent Concentrations				
CA-10	02/23/93	3	6	< 0.5	< 0.5	< 0.1
	04/16/93	6	18	< 0.5	< 0.5	< 0.1
	07/14/93	2	5	< 0.5	< 0.5	< 0.1
	10/10/93	7	41	< 0.5	< 0.5	< 0.1
	01/11/94	3	12	< 0.5	< 0.5	< 0.1
	03/26/94	2	5	< 0.5	< 0.5	< 0.1
	07/13/94	2	5	< 0.5	< 0.5	< 0.1
	10/19/94	5	21	< 0.5	< 0.5	< 0.1
	01/10/95	3	9	2	< 0.5	< 0.1
	04/07/95	4	10	< 0.5	NT	NT
	07/19/95	2	3	< 0.5	NT	NT
	10/10/95	3	13	< 0.5	NT	NT
	01/10/96	3	5	< 0.5	NT	NT
	Sample Mean	3.5	11.8	BDL	BDL	BDL
CA-11	08/29/92	6	15	0.3	NT	NT
	01/12/93	3	5	< 0.5	< 0.5	< 0.1
	04/14/93	3	3	< 0.5	< 0.5	< 0.1
	07/12/93	2	2	< 0.5	< 0.5	< 0.1
	09/30/93	2	2	< 0.5	< 0.5	< 0.1
	01/06/94	1	1	< 0.5	< 0.5	< 0.1
	03/23/94	0.9	1	< 0.5	< 0.5	< 0.1
	07/08/94	1	1	< 0.5	< 0.5	< 0.1
	10/03/94	2	2	< 0.52	< 0.5	< 0.1
	01/09/95	1	1	< 0.5	< 0.5	< 0.1
	04/06/95	1	0.9	< 0.5	NT	NT
	07/17/95	1	0.9	< 0.5	NT	NT
	10/09/95	1	1	< 0.5	NT	NT
	01/09/96	1	1	< 0.5	NT	NT
	Sample Mean	1.9	2.6	< 0.5	BDL	BDL
CA-12	02/02/93	0.8	0.9	< 0.5	< 0.5	< 0.1
	04/15/93	2	0.9	< 0.5	< 0.1	< 0.2
	07/07/93	1	0.8	< 0.5	< 0.5	< 0.1
	09/29/93	1	0.9	< 0.5	< 0.5	< 0.1
	01/05/94	2	0.8	< 0.5	< 0.5	< 0.1
	03/23/94	1	0.6	< 0.5	< 0.5	< 0.1
	07/21/94	1	0.6	< 0.5	< 0.5	< 0.1
	09/29/94	1	0.7	< 0.5	< 0.5	< 0.1
	01/06/95	1	0.6	< 0.5	< 0.5	< 0.1
	04/05/95	1	< 0.5	< 0.5	NT	NT
	07/07/95	1	< 0.5	< 0.5	NT	NT
	10/06/95	1	0.8	< 0.5	NT	NT
	01/08/96	1	0.5	< 0.5	NT	NT
	Sample Mean	1.1	0.7	BDL	BDL	BDL

TABLE 2

SUMMARY OF ANALYTICAL RESULTS OF WELLS SAMPLED AFTER 39 MONTHS OF REMEDIAL SYSTEM OPERATION
QUARTERLY GROUND WATER MONITORING REPORT, OPERABLE UNIT NO. 2
DEFENSE DEPOT OGDEN, UTAH

		Ground Water Constituent				
		TCE	**cis-1,2-DCE**	**PCE**	**Chlordane**	**DDD**
	MCL (ppb)	5	70	5	2	NA
	Treatment System Effluent Requirements (ppb)	2.5	35	NA	NA	NA
Sample Location	**Sampling Date**	**Constituent Concentrations**				
E-1	10/04/92	4.6	11	NT	< 1.0	NT
	10/15/92	4	8.4	NT	< 0.5	NT
	11/12/92	11	16	< 0.5	< 0.5	< 0.1
	01/12/93	5	9	< 0.5	< 0.5	< 0.1
	04/13/93	5	7	< 0.5	< 0.5	< 0.1
	07/08/93	3	4	< 0.5	< 0.5	< 0.1
	09/27/93	3	5	< 0.5	< 0.5	< 0.1
	01/04/94	4	7	< 0.5	< 0.5	< 0.1
	03/21/94	4	9	< 0.5	< 0.5	< 0.1
	07/21/94	4	7	< 0.5	< 0.5	< 0.1
	09/27/94	4	5	< 0.5	< 0.5	< 0.1
	01/04/95	3	8	< 0.5	< 0.5	< 0.1
	04/04/95	3	5	< 0.5	NT	NT
	07/12/96	2	3	< 0.5	NT	NT
	10/03/95	2	4	< 0.5	NT	NT
	01/04/96	3	5	< 0.5	NT	NT
	Sample Mean	4.0	7.1	BDL	BDL	BDL
E-2	10/02/92	3.2	4.3	NT	< 1.0	NT
	10/15/92	3.9	42.6	NT	< 0.5	NT
	11/12/92	2	21	< 0.5	< 0.5	< 0.1
	01/12/93	7	30	< 0.5	< 0.5	0.1
	04/13/93	5	9	< 0.5	< 0.5	< 0.1
	07/08/93	< 0.5	< 0.5	< 0.5	< 0.5	< 0.1
	09/27/93	2	4	< 0.5	< 0.5	< 0.1
	01/04/94	6	15	< 0.5	< 0.5	< 0.1
	03/21/94	6	11	< 0.5	< 0.5	< 0.1
	07/14/94	0.8	0.6	< 0.5	< 0.5	< 0.1
	09/27/94	3	3	< 0.5	< 0.5	< 0.1
	01/04/95	6	34	< 0.5	< 0.5	< 0.1
	04/04/95	6	11	< 0.5	NT	NT
	07/12/95	0.9	0.6	< 0.5	NT	NT
	10/03/95	0.9	0.9	< 0.5	NT	NT
	01/04/96	5	12	< 0.5	NT	NT
	Sample Mean	3.6	12.5	BDL	BDL	BDL

TABLE 2

SUMMARY OF ANALYTICAL RESULTS OF WELLS SAMPLED AFTER 39 MONTHS OF REMEDIAL SYSTEM OPERATION
QUARTERLY GROUND WATER MONITORING REPORT, OPERABLE UNIT NO. 2
DEFENSE DEPOT OGDEN, UTAH

		Ground Water Constituent				
		TCE	cis-1,2-DCE	PCE	Chlordane	DDD
	MCL (ppb)	5	70	5	2	NA
	Treatment System Effluent Requirements (ppb)	2.5	35	NA	NA	NA
Sample Location	Sampling Date	Constituent Concentrations				
E-3	10/02/92	2.7	4.7	NT	< 1.0	NT
	10/15/92	3	28.4	NT	< 0.5	NT
	11/12/92	11	63	< 0.5	< 0.5	< 0.1
	01/12/93	4	21	< 0.5	< 0.5	< 0.1
	04/13/93	3	9	< 0.5	< 0.5	< 0.1
	07/08/93	0.9	0.7	< 0.5	< 0.5	< 0.1
	09/27/93	3	5	< 0.5	< 0.5	< 0.1
	01/04/94	5	16	< 0.5	< 0.5	< 0.1
	07/14/94	0.9	1	< 0.5	< 0.5	< 0.1
	9/27/294	2	9	< 0.5	< 0.5	< 0.1
	01/04/95	4	19	< 0.5	< 0.5	< 0.1
	04/04/95	3	10	< 0.5	NT	NT
	07/12/95	1	1	< 0.5	NT	NT
	10/03/95	1	1	< 0.5	NT	NT
	01/04/96	3	13	< 0.5	NT	NT
	Sample Mean	3.2	13.5	BDL	BDL	BDL
E-4	10/02/92	5.0	16.0	NT	< 1.0	NT
	10/15/92	5.5	26.8	NT	< 0.5	NT
	11/12/92	10	39	< 0.5	< 0.5	< 0.1
	01/28/93	4	11	< 0.5	< 0.5	< 0.1
	04/13/93	4	12	< 0.5	< 0.5	< 0.1
	07/08/93	4	11	< 0.5	< 0.5	< 0.1
	09/27/93	6	29	< 0.5	< 0.5	< 0.1
	01/04/94	3	7	< 0.5	< 0.5	< 0.1
	03/21/94	2	3	< 0.5	< 0.5	< 0.1
	07/19/94	3	8	< 0.5	< 0.5	< 0.1
	09/27/94	5	17	< 0.5	< 0.5	< 0.1
	01/04/95	3	8	< 0.5	< 0.5	< 0.1
	04/04/95	3	6	< 0.5	NT	NT
	07/12/95	2	4	< 0.5	NT	NT
	10/03/95	4	11	< 0.5	NT	NT
	01/04/96	2	6	< 0.5	NT	NT
	Sample Mean	4.1	13.4	BDL	BDL	BDL

TABLE 2

SUMMARY OF ANALYTICAL RESULTS OF WELLS SAMPLED AFTER 39 MONTHS OF REMEDIAL SYSTEM OPERATION
QUARTERLY GROUND WATER MONITORING REPORT, OPERABLE UNIT NO. 2
DEFENSE DEPOT OGDEN, UTAH

		Ground Water Constituent				
		TCE	**cis-1,2-DCE**	**PCE**	**Chlordane**	**DDD**
	MCL (ppb)	5	70	5	2	NA
	Treatment System Effluent Requirements (ppb)	2.5	35	NA	NA	NA
Sample Location	**Sampling Date**	**Constituent Concentrations**				
E-5	10/02/92	4.7	25	NT	< 1.0	NT
	10/15/92	3.8	22.4	NT	< 0.5	NT
	11/12/92	3	10	< 0.5	< 05	< 0.1
	01/12/93	2	5	< 0.5	< 0.5	< 0.1
	04/13/93	2	4	< 0.5	< 0.5	< 0.1
	07/08/93	2	6	< 0.5	< 0.5	< 0.1
	09/27/93	4	24	< 0.5	< 0.5	< 0.1
	01/04/94	2	4	< 0.5	< 0.5	< 0.1
	03/21/94	0.7	1	< 0.5	< 0.5	< 0.1
	07/19/94	2	7	< 0.5	< 0.5	< 0.1
	09/27/94	2	12	< 0.5	< 0.5	< 0.1
	01/04/95	1	3	< 0.5	< 0.5	< 0.1
	04/04/95	0.9	2	< 0.5	NT	NT
	07/12/95	0.7	1	< 0.5	NT	NT
	10/03/96	3	15	< 0.5	NT	NT
	01/04/96	0.9	2	< 0.5	NT	NT
	Sample Mean	2.2	9.0	BDL	BDL	BDL
E-6	10/02/92	5.4	21	NT	< 1.0	NT
	10/15/92	4.4	20.4	NT	< 0.5	NT
	11/12/92	5	13	< 0.5	< 0.5	< 0.1
	01/12/93	3	15	< 0.5	< 0.5	< 0.1
	04/13/93	2	4	< 0.5	< 0.5	< 0.1
	07/08/93	3	11	< 0.5	< 0.5	< 0.1
	09/27/93	6	27	< 0.5	< 0.5	< 0.1
	01/04/94	3	7	< 0.5	< 0.5	< 0.1
	03/21/94	1	2	< 0.5	< 0.5	< 0.1
	07/15/94	2	5	< 0.5	< 0.5	< 0.1
	10/28/94	3	8	< 0.5	< 0.5	< 0.1
	01/04/95	2	5	< 0.5	< 0.5	< 0.1
	04/04/95	2	3	< 0.5	NT	NT
	07/07/95	1	< 0.5	< 0.5	NT	NT
	10/03/95	3	13	< 0.5	NT	NT
	01/04/96	2	5	< 0.5	NT	NT
	Sample Mean	3.0	10.0	BDL	BDL	BDL

TABLE 2

SUMMARY OF ANALYTICAL RESULTS OF WELLS SAMPLED AFTER 39 MONTHS OF REMEDIAL SYSTEM OPERATION
QUARTERLY GROUND WATER MONITORING REPORT, OPERABLE UNIT NO. 2
DEFENSE DEPOT OGDEN, UTAH

		Ground Water Constituent				
		TCE	cis-1,2-DCE	PCE	Chlordane	DDD
	MCL (ppb)	5	70	5	2	NA
	Treatment System Effluent Requirements (ppb)	2.5	35	NA	NA	NA
Sample Location	Sampling Date	Constituent Concentrations				
E-9	10/04/92	5.5	11	NT	< 1.0	NT
	10/15/92	5	9.9	NT	< 0.5	NT
	11/12/92	8	12	< 0.5	< 0.5	< 0.1
	01/28/93	6	7	< 0.5	< 0.5	< 0.1
	04/13/93	4	4	< 0.5	< 0.5	< 0.1
	07/08/93	3	3	< 0.5	< 0.5	< 0.1
	09/27/93	4	3	< 0.5	< 0.5	< 0.1
	01/04/94	3	2	< 0.5	< 0.5	< 0.1
	03/21/94	3	2	< 0.5	< 0.5	< 0.1
	07/18/94	2	2	< 0.5	< 0.5	< 0.1
	09/27/94	2	2	< 0.5	< 0.5	< 0.1
	01/04/95	2	2	< 0.5	< 0.5	< 0.1
	04/04/95	2	2	< 0.5	NT	NT
	07/12/95	2	1	< 0.5	NT	NT
	10/03/95	2	2	< 0.5	NT	NT
	01/04/96	2	2	< 0.5	NT	NT
	Sample Mean	3.5	4.2	BDL	BDL	BDL
E-10	10/04/92	4.7	13	NT	< 1.0	NT
	10/15/92	4.4	9.1	NT	< 0.5	NT
	11/12/92	4	7	< 0.5	< 0.5	< 0.1
	01/12/93	4	7	< 0.5	< 0.5	< 0.1
	04/13/93	4	5	< 0.5	< 0.5	< 0.1
	07/08/93	3	4	< 0.5	< 0.5	< 0.1
	09/27/93	3	6	< 0.5	< 0.5	< 0.1
	01/04/94	3	6	< 0.5	< 0.5	< 0.1
	03/21/94	3	5	< 0.5	< 0.5	< 0.1
	07/18/94	2	4	< 0.5	< 0.5	< 0.1
	09/27/94	2	4	< 0.5	< 0.5	< 0.1
	01/04/95	3	6	< 0.5	< 0.5	< 0.1
	04/04/95	2	4	< 0.5	NT	NT
	07/12/95	1	2	< 0.5	NT	NT
	10/03/95	1	2	< 0.5	NT	NT
	01/04/96	2	3	< 0.5	NT	NT
	Sample Mean	2.9	5.4	BDL	BDL	BDL